REMARKS

Reconsideration of the above-identified application, as amended, is respectfully requested.

In the present Official Action, Claim 9 was rejected under 35 U.S.C. §112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is alleged that Claim 9 provides a broad definition of a range/limitation that is dependent upon a claim (Claim 7) having a narrower statement of the range/limitation.

In response to this rejection, Claim 9 is being amended to depend from Claim 1 only, to set forth that the blocking impurity is C, singly or in combination with said Sn or Pb which are recitations currently set forth in Claim 1. Thus, Claim 9 as amended, further narrows Claim 1 in a manner that avoids the indefiniteness and the Examiner is respectfully requested to withdraw the rejection of Claim 9, as now amended.

In the Office Action, the Examiner rejected the Claim 9 under 35 U.S.C. §102(e) as allegedly being anticipated by Xiang (U.S. Patent No. 6,849,527)("Xiang").

Further in the Office Action, the Examiner rejected the Claims 1, 2 and 4-9 under 35 U.S.C. §103(a) as allegedly being unpatentable over Xiang in view of Noda et al. (U.S. Patent No. 6,432,802)("Noda").

In response to both the rejection of both Claim 9 under 35 U.S.C. §102(e) and Claims 1, 2 and 4-9 under 35 U.S.C. §103(a) as being unpatentable over Xiang in view of Noda, Applicants respectfully disagree.

In response, to be filed subsequently herewith, applicants submit a Rule 1.131 affidavit providing sufficient evidence to antedate the reference to Xiang (Xiang has a filing date of October 14, 2003) by showing proof of conception and reduction to practice of the present invention within the United States before the October 14, 2003 filing date of Xiang. Applicant submits that this affidavit is sufficient to remove Xiang from consideration which would obviate the rejection of Claims 1, 2 and 4-9 under 35 U.S.C. §103(a) and Claim 9 under 35 U.S.C. §102(e).

However, with respect to the rejection, Claim 1 sets forth a semiconducting field-effect transistor device comprising:

a first strained layer of semiconductor material doped of a first dopant type formed on a substrate;

a source region and a drain region implanted with dopants of a second opposite type;

a gate electrode separated from the first layer by a dielectric region, and positioned between said source and drain regions;

said substrate having one or more threading dislocations, misfit dislocations or crystal defects that extend continuously from the source region to the drain region at an interface between said first strained layer of semiconductor material and said substrate, and

blocking impurity dopant materials selected from the group comprising: In, Pb, Sb and Sn, that partially or fully occupies each said one or more threading dislocations, misfit dislocations or crystal defects along said interface, wherein said blocking impurity dopant materials substantially inhibit diffusion of said implanted source and drain dopants from

diffusing along said threading dislocations, misfit dislocations or crystal defect along said interface.

Respectfully, in the present invention, it is clear that the semiconducting substrate of the FET device claimed has one or more threading dislocations, misfit dislocations or crystal defects that extend continuously from the source region to the drain region along an interface between a first strained layer of semiconductor material and the substrate, and that blocking impurity dopant materials selected from the group comprising: In, Pb, Sb and Sn, are provided that partially or fully occupies each said one or more threading dislocations, misfit dislocations or crystal defects along the interface, wherein said blocking impurity dopant materials substantially inhibit diffusion of said implanted source and drain dopants from diffusing along said threading dislocations, misfit dislocations or crystal defect along the interface.

Notwithstanding the applicants antedating of Xiang, to be submitted, Xiang, respectfully, only teaches use of a Carbon impurity implanted in a device active region for purposes of enhancing carrier mobility in that region. That is, Xiang is only concerned with matching hole mobility in a PMOS device to balance an amount of hole mobility provided with a corresponding connected NMOS device. The purpose of Xiang's impurity implantation is to change the lattice spacing within the strained silicon lattice of a device channel to impart additional strain to bolster the hole minority carrier in the PMOS device channel.

This is very different from the present invention as follows:

1. Xiang does not teach nor suggest use of such impurity implants to perform a blocking function. In fact, Xiang teaches away from the teachings of Claim 1, as amended, as impurities are implanted in the strained layer portion of the device channel region per se (See Xiang at Fig. 3c) to increase the level of strain and hence, carrier mobility, and does not teach or suggest blocking impurity dopant materials that partially or fully occupy threading dislocations, misfit dislocations or crystal defects along an interface between a first strained layer of semiconductor material and the substrate.

2. Xiang does not teach impurity dopant materials selected from the group comprising: In, Pb, Sb and Sn, that partially or fully occupies each said one or more threading dislocations, misfit dislocations or crystal defects along the interface between a first strained layer of semiconductor material and the substrate.

3. Xiang's and Noda's teaching of use of halo regions is not suggestive of the inventive implantation of impurity dopant materials selected from the group comprising: In, Pb, Sb and Sn, that partially or fully occupies each said one or more threading dislocations, misfit dislocations or crystal defects along the interface between a first strained layer of semiconductor material and the substrate. Halo implantations are doped regions that help suppress short channel "punchthrough" effect by shortening the depletion regions at the *ends of the source and drain regions* and are only formed at *opposing sides* of a device channel to prevent source/drain dopant diffusion into the

"channel region". To the contrary, in the present invention, impurity dopant materials are implanted to partially or fully occupy each said one or more threading dislocations, misfit dislocations or crystal defects along the interface between a first strained layer of semiconductor material and the substrate (and NOT at opposing sides of a device channel).

4. Notwithstanding Noda's teaching of using In, Pb, Sb and other impurities besides Carbon (which is taught in Xiang only for purposes of enhancing the strain of a Si-based layer in the channel region), again Xiang's and Noda's dopant implantation structures are to provide source/drain halo regions which, structurally, are at opposing sides of a channel and only for purposes of preventing diffusion of dopants into a device channel region per se. This is not a teaching of a structure having impurity dopant materials implanted to partially or fully occupy each said one or more threading dislocations, misfit dislocations or crystal defects along the interface between a first strained layer of semiconductor material and the substrate to substantially inhibit diffusion of said implanted source and drain dopants from diffusing along said threading dislocations, misfit dislocations or crystal defect along the interface.

For these reasons, Xiang, whether taken alone or in combination with Noda, does not render Claim 1 as amended unpatentable as neither Xiang (nor Noda) teaches use of a blocking impurity dopant material that partially or fully occupies each said one or more

threading dislocations, misfit dislocations or crystal defects along an interface between a first strained layer of semiconductor material and the substrate, as recited in amended Claim 1. Claim 1 as amended includes the implantation of blocking impurities NOT in a halo region abutting the source and drain dopant regions, but along the interface between the first strained layer and the substrate - thereby substantially inhibiting diffusion of implanted source and drain dopants from diffusing along said threading dislocations, misfit dislocations or crystal defect along said interface. That is, the present invention does not utilize halo extensions nor is relying on any teaching thereof.

Thus, since each and every limitation within applicant's invention as disclosed and claimed within amended claim 1 is not taught in Xiang, either expressly or inherently, whether taken alone or in combination with Noda, applicant asserts that claim 1 may not properly be rejected under 35 U.S.C. §103(a) as being unpatentable over Xiang in view of Noda. Moreover, due to their dependency upon claim 1, applicant also asserts that claims 2, and 4 - 9 may also not properly be rejected under 35 U.S.C. §103(a) by virtue of their dependency upon Claim 1 as amended. As such, the Examiner is respectfully requested to withdraw the rejection of Claims 1, 2 and 4-9 under 35 U.S.C. §103(a) and the rejection of Claim 9 under 35 U.S.C. §102(e).

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance be issued. If the Examiner believes that a telephone conference with the Applicants' attorneys would be advantageous to the disposition of this

case, the Examiner is requested to telephone the undersigned, Applicants' attorney, at the following telephone number: (516) 742-4343.

Respectfully submitted,

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